

What is claimed is:

1. A hologram recording and reproducing apparatus for recording data on a recording medium and reproducing data from the recording medium, the recording medium being made of a photorefractive crystal having a parallel plate shape, said apparatus comprising:

a support portion for detachably supporting and rotating the recording medium;

a recording-reference-light-beam-supplying-portion for supplying a coherent recording reference light beam propagating along an optical axis to a major surface of said recording medium;

a signal-light-beam-supplying-portion for supplying a coherent signal light beam which is modulated in accordance with image data, in an optical path into the recording medium such that said signal light beam intersects with the reference light beam to produce an optical interference pattern with said reference and signal light beams within said recording medium;

a reproducing-reference-light-beam-supplying-portion for supplying into the recording medium a coherent reproducing reference light beam propagating in an opposite direction along said optical axis of the recording reference light beam to generate a phase conjugation wave from a refractive-index grating of the light interference pattern;

a splitting portion for splitting the phase conjugation wave from the optical path of said signal light beam to image a dot pattern with the phase conjugation wave; and

09978076-101704

a photo-detecting portion for detecting the dot pattern imaged with said phase conjugation wave to reproduce the image data.

2. A hologram recording and reproducing apparatus according to claim 1, wherein said reproducing reference light beam has an across-section having an area larger than that of said recording reference light beam.

3. A hologram recording and reproducing apparatus according to claim 1, wherein said reproducing-reference-light-beam-supplying-portion includes a reflector for reflecting the recording reference light beam passing through said recording medium back to said recording medium; and a shutter capable of cutting off said recording reference light beam and disposed in the optical path to said reflector.

4. A hologram recording and reproducing apparatus according to claim 1, further comprising a $1/2$ wave plate disposed in the optical path of said reproducing reference light beam.

5. A hologram recording and reproducing apparatus according to claim 1, wherein said reproducing-reference-light-beam-supplying-portion includes a reflector for reflecting the recording reference light beam passing through said recording medium back to said recording medium; and a $1/4$ wave plate disposed in the optical path to said reflector.

6. A hologram recording and reproducing apparatus according to claim 1, when said recording medium is sensitive to gate light having a shorter than that of the reference and signal light beams to develop light induced absorption, said apparatus further comprising a gate-light-beam-supplying-portion for supplying the gate light beam into the recording medium.